

***Potamotrygon henlei* (a stingray, no common name)**

Ecological Risk Screening Summary

U.S. Fish & Wildlife Service, July 2012
Revised, September 2018
Web Version, 10/29/2020

Organism Type: Fish

Overall Risk Assessment Category: Uncertain

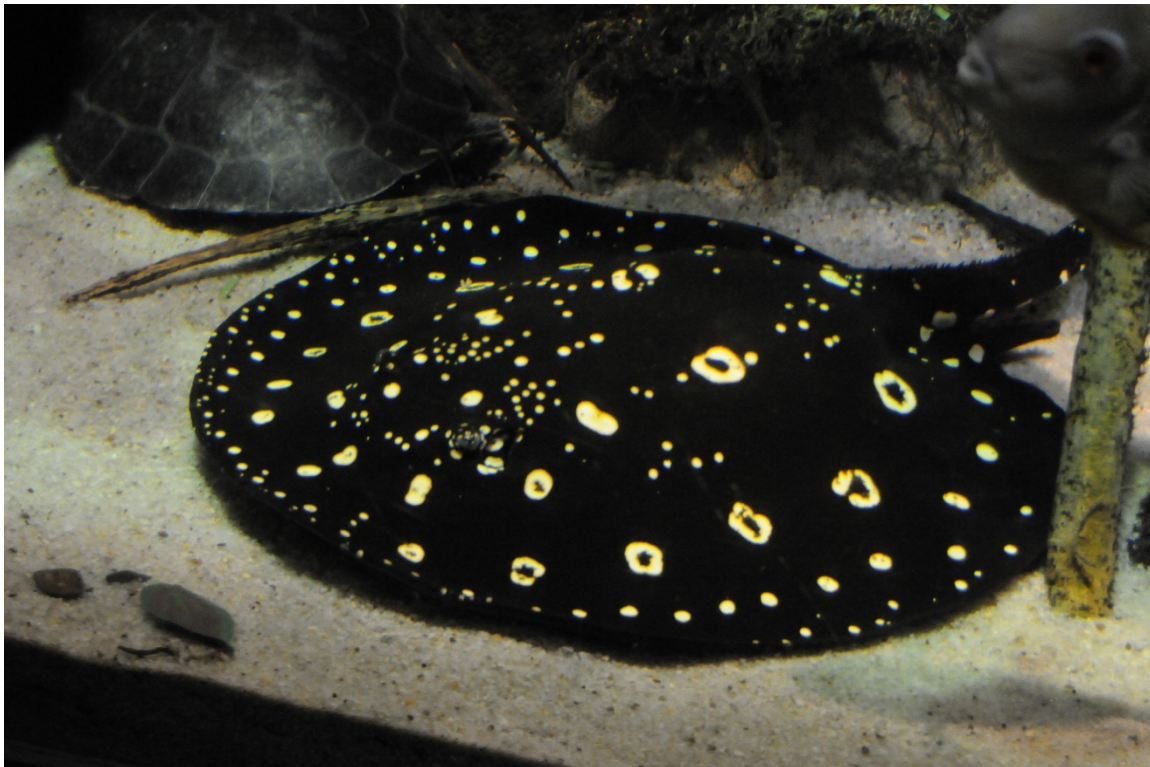


Photo: Christine Schmidt. Licensed under Creative Commons BY 2.0 Generic. Available: https://commons.wikimedia.org/wiki/File:Potamotrygon_national_aquarium.jpg. (September 5, 2018).

1 Native Range and Status in the United States

Native Range

From Froese and Pauly (2018):

“[In Brazil:] Known from the Tocantins River basin in Tocantins and Araguaia rivers [de Carvalho et al. 2003]. Type locality, Rio Tocantins [Eschmeyer 1998].”

Status in the United States

No records of *Potamotrygon henlei* in the wild in the United States were found. *P. henlei* is in trade in the United States.

From AquaScapeOnline (2018):

“Henlei Stingray 10”-11” (*Potamotrygon henlei*) [...] Our Price: \$1,300.00”

The Florida Fish and Wildlife Conservation Commission has listed the freshwater stingray *Potamotrygon henlei* as a conditional species. Conditional nonnative species (FFWCC 2018), “are considered to be dangerous to the ecology and/or the health and welfare of the people of Florida. These species are not allowed to be personally possessed, although exceptions are made by permit from the Executive Director for research, commercial use (with security measures to prevent escape or release) or public exhibition purposes.”

Means of Introductions in the United States

No records of *Potamotrygon henlei* in the wild in the United States were found.

Remarks

From Rincon (2004):

“Sometimes misidentified with *P. leopoldi* or *P. motoro*. Needs correct identification and reliable diagnosis in order to control the ornamental fish trade in Amazonas, Pará and Tocantins States [Brazil].”

2 Biology and Ecology

Taxonomic Hierarchy and Taxonomic Standing

According to Eschmeyer et al. (2018), *Potamotrygon henlei* (Castelnau 1855) is the valid name for this species.

From ITIS (2018):

Kingdom Animalia
Subkingdom Bilateria
Infrakingdom Deuterostomia
Phylum Chordata
Subphylum Vertebrata
Infraphylum Gnathostomata
Superclass Chondrichthyes
Class Chondrichthyes
Subclass Elasmobranchii
Superorder Euselachii
Order Myliobatiformes

Family Potamotrygonidae
Genus *Potamotrygon*
Species *Potamotrygon henlei* (Castelnau, 1855)

Size, Weight, and Age Range

From Froese and Pauly (2018):

“Max length : 45.0 cm WD male/unsexed; [de Carvalho et al. 2003]”

From Rincon (2004):

“Maximum size 104.2 cm total length (TL) (71 cm disc width (DW)). Females mature at approximately 80 to 85 cm TL (around 50 cm DW).”

Environment

From Froese and Pauly (2018):

“Freshwater; benthopelagic; pH range: 5.8 - 7.2; dH range: 4 - 15. [...]; 23°C - 28°C [assumed to be recommended aquarium temperature] [Baensch and Riehl 1995]”

Climate

From Froese and Pauly (2018):

“Tropical; [...]”

Distribution Outside the United States

Native

From Froese and Pauly (2018):

“[In Brazil:] Known from the Tocantins River basin in Tocantins and Araguaia rivers [de Carvalho et al. 2003]. Type locality, Rio Tocantins [Eschmeyer 1998].”

Introduced

No records of *Potamotrygon henlei* introductions were found.

Means of Introduction Outside the United States

No records of *Potamotrygon henlei* introductions were found.

Short Description

From Ramos (2017):

“The dorsal color pattern is blackish to grayish-brown, with relatively few ocelli. Those ones present a yellowish to light orange color and are usually round, but different elongate shapes

could be found. The ocelli have thin black contours and lighter centers [...] and are much larger than the eyes (CARVALHO, 2016a).”

From Conceição et al. (2012):

“Their spines are hard, sharp, bilaterally retroserrated and covered by an integumentary sheath with a ventrolateral glandular groove containing venom glands along both edges (Halstead, 1970) and the mucus of biological importance that covers the entire body of these animals.”

Biology

From Rincon (2004):

“This species has not been negatively affected by the damming of the lower Tocantins, in fact there has been a significant population increase in the Tucuruí Reservoir (probably due to an increase in prey), [...]”

“It seems to prefer mud bottoms where it hunts gastropod molluscs, their most important food item (Pantano-Neto 2001). [...] Ovoviviparous, number of young ranges from 1 up to nine embryos a litter and number of embryos is related to maternal size. Size at birth is approximately 25 to 30 cm TL. Gestation time and reproductive periodicity unknown. In the area of the Tucuruí reservoir it breeds year-round, probably due to the artificial water level control inside the reservoir.”

Human Uses

From Rincon (2004):

“[...] the species [*Potamotrygon henlei*] is collected in the unregulated ornamental fish trade, [...]”

“This species is exported for the ornamental trade as *P. motoro*, officially from Manaus and illegally from Belém. Legal ornamental fishing of this species was recently approved on the grounds that scientific research is also carried out in order to provide sustainable levels.”

According to Ramos (2017), just under 4,000 individuals of *Potamotrygon henlei* were exported from Brazil between 2003 and 2016.

From Ramos (2017):

“Its ornamental commerce is limited to 1000 specimens [per year] from Pará state in Brazil. Only specimens smaller than 30cm can be caught for the ornamental commerce. It’s the second most expensive specie [*sic*] exported from Brazil, but have few registers [*sic*] of illegal trade.”

Cardoso dos Santos et al. (2017) used *Potamotrygon henlei* venom to study immune responses in mice.

From Conceição et al. (2012):

“*Potamotrygon* cf. *henlei* venom and mucus are an extensive source of bioactive compounds. This study described the biological properties of an antimicrobial protein from mucus. The protein named PcfHb has 16072.8 Da and is similar to the β -chain of hemoglobin. PcfHb was active against bacteria, yeast and assayed for its role on the microcirculation. This is the first description of a bioactive polypeptide from the mucus of a stingray.”

Potamotrygon henlei is in trade in the United States.

From AquaScapeOnline (2018):

“Henlei Stingray 10”-11” (*Potamotrygon henlei*) [...] Our Price: \$1,300.00”

P. henlei is listed as a Conditional species requiring a permit for possession in Florida (FFWCC 2018).

Diseases

No records of OIE-reportable diseases (OIE 2020) were found for *Potamotrygon henlei*.

Marques and Brooks (2003) list *P. henlei* as a host for *Rhinebothroides freitasi*, and *R. glandularis*.

Marques (2000) lists *P. henlei* as a host for *Plesiorhinebothroides jaime*, *Rhinebothrium paratrygoni*, *Potamotrygonocetus* sp. 1, *Megapriapus* cf. *ungriai*, and *Acanthobothrium* cf. *regoi*

Marques et al. (2003) list *P. henlei* as a host for *Potamotrygonocetus maurae*, and *Potamotrygonocetus* sp. 8.

Poelen et al. (2014) list *Potamotrygonocotyle chisholmae*, and *P. dromedaries* as parasites of *Potamotrygon henlei*.

Threat to Humans

According to Reckziegel et al. (2015), *Potamotrygon henlei* was responsible for human injuries between 2007 and 2013.

From Charvet-Almeida et al. (2002):

“The stingrays (*P. henlei*) have learned to eat the meshed fishes caught in the gillnets, and fisherman do not kill them since their meat has no commercial value in the region.”

3 Impacts of Introductions

No records of *Potamotrygon henlei* introductions were found, therefore there is no information on impacts of introductions.

P. henlei is listed as a Conditional species requiring permit for possession in Florida (FFWCC 2018).

4 History of Invasiveness

No records of *Potamotrygon henlei* introductions were found. Therefore, the history of invasiveness is classified as No Known Nonnative Population. There is information on the volume and duration of commercial trade for this species. However, the volume of trade was not large enough to consider it to have a substantial trade history which would have resulted in a low history of invasiveness.

5 Global Distribution



Figure 1. Known global distribution of *Potamotrygon henlei*. Location is in central Brazil. Map from GBIF Secretariat (2018).

6 Distribution Within the United States

No records of *Potamotrygon henlei* in the wild in the United States were found.

7 Climate Matching

Summary of Climate Matching Analysis

The climate match for *Potamotrygon henlei* was generally low for the contiguous United States. There was an area of medium climate match in southwest Florida. The Climate 6 score (Sanders et al. 2018; 16 climate variables; Euclidean distance) for the contiguous United States was 0.000, low (scores between 0.000 and 0.005, inclusive are classified as low). All States had low individual climate scores.

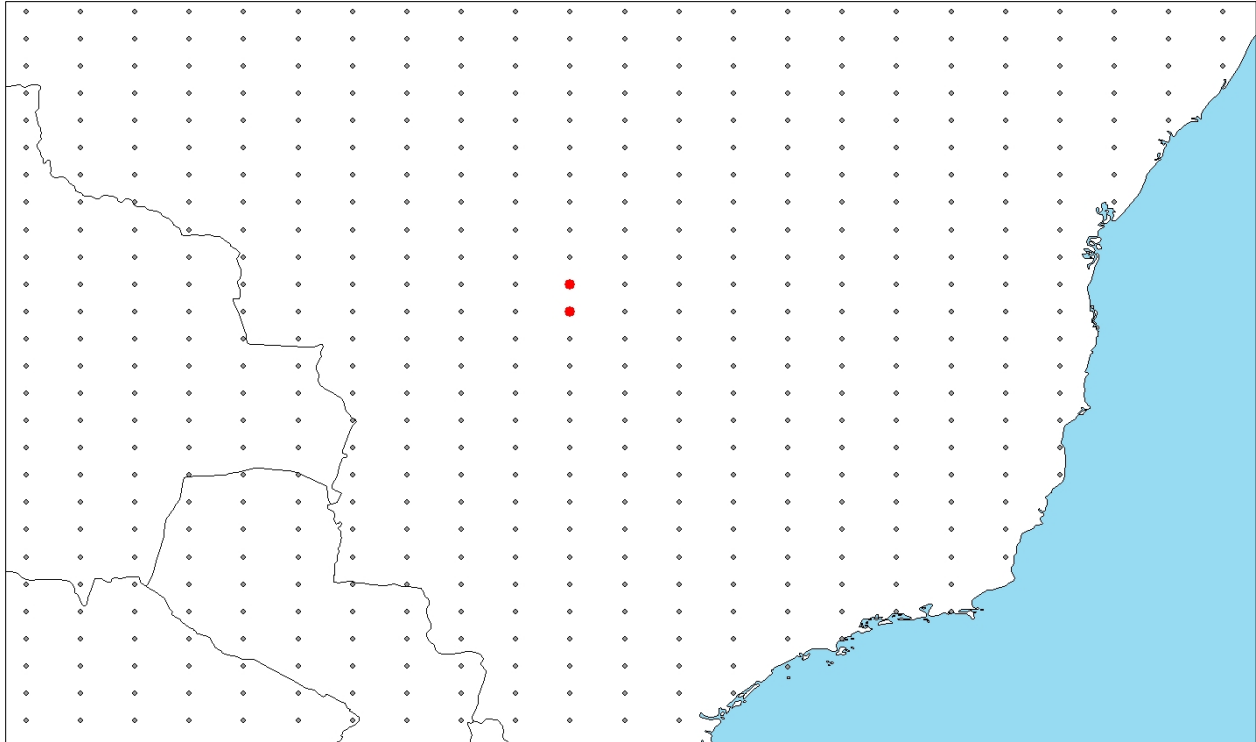


Figure 2. RAMP (Sanders et al. 2018) source map showing weather stations in South America selected as source locations (red; Brazil) and non-source locations (gray) for *Potamotrygon henlei* climate matching. Source locations from GBIF Secretariat (2018). Selected source locations are within 100 km of one or more species occurrences, and do not necessarily represent the locations of occurrences themselves.

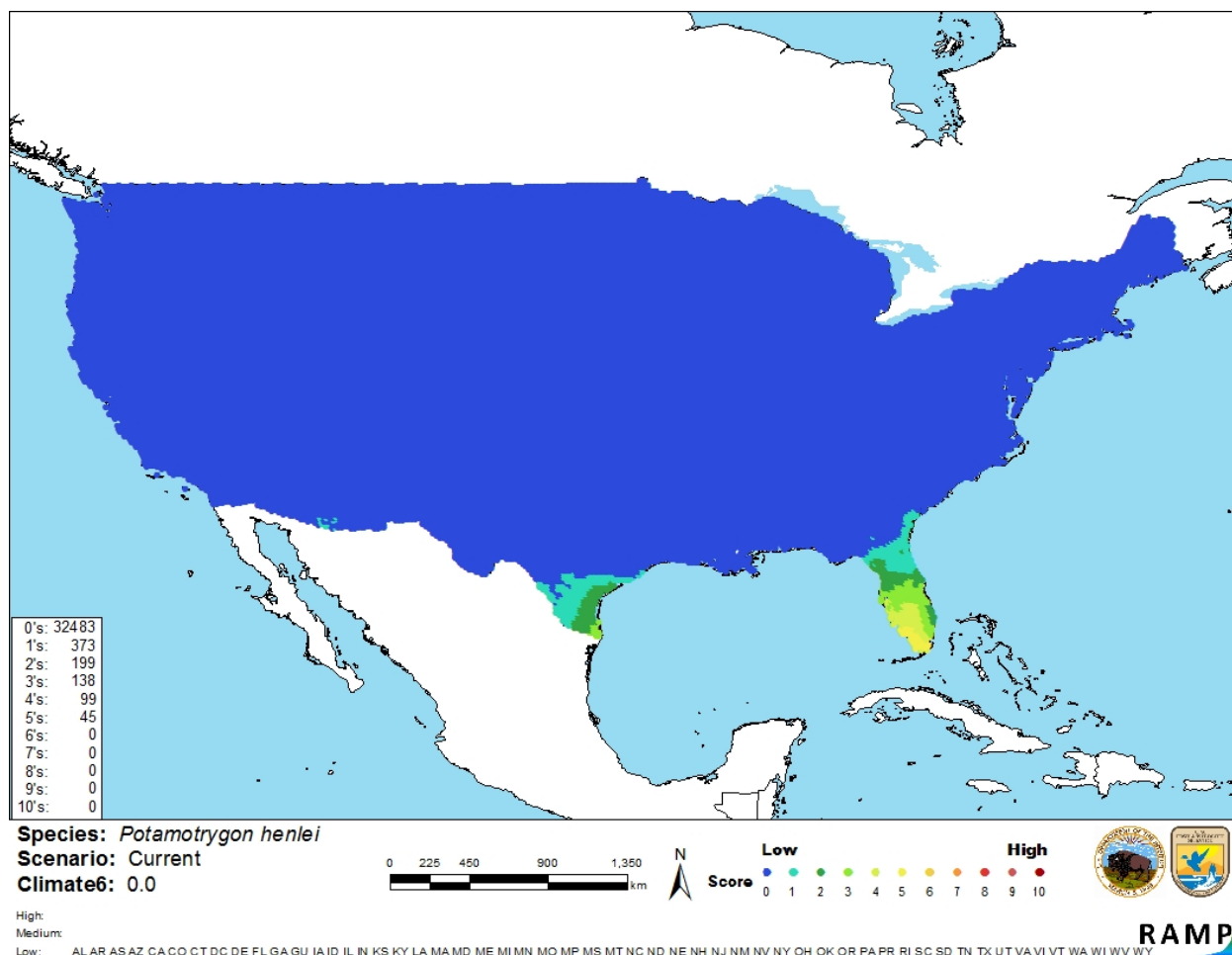


Figure 3. Map of RAMP (Sanders et al. 2018) climate matches for *Potamotrygon henlei* in the contiguous United States based on source locations reported by GBIF Secretariat (2018). Counts of climate match scores are tabulated on the left. 0/Blue = Lowest match, 10/Red = Highest match.

The High, Medium, and Low Climate match Categories are based on the following table:

Climate 6: (Count of target points with climate scores 6-10)/ (Count of all target points)	Overall Climate Match Category
$0.000 \leq X \leq 0.005$	Low
$0.005 < X < 0.103$	Medium
≥ 0.103	High

8 Certainty of Assessment

The certainty of assessment for *Potamotrygon henlei* is low. There is some general information available about this species. Its described range is narrow, and one georeferenced point was available for climate matching. No records of introduction were found so there is no information on impacts of introduction to evaluate. Information on the volume of trade in this species was

available but volume of trade was not large enough to be considered a substantial trade history and then classify history of invasiveness as low.

9 Risk Assessment

Summary of Risk to the Contiguous United States

Potamotrygon henlei is a species of freshwater stingray found in the Tocantins River basin in central Brazil. *P. henlei* is part of the ornamental aquarium trade, including in the United States. The venom and mucus of *P. henlei* is used in research. The spine on the tail of the stingray is coated in venom and is capable of inflicting wounds on humans. *P. henlei* opportunistically feeds on fish caught in gillnets. *P. henlei* is listed as a Conditional species in Florida. The history of invasiveness is classified as No Known Nonnative Population. There were no records of introduction found. While this species is in trade, the reported trade volume was relatively low which is maintained by export quotas in Brazil. The climate match with the contiguous United States was low. The only area of medium climate match was in southwestern Florida. The certainty of assessment is low. The overall risk assessment category is uncertain.

Assessment Elements

- **History of Invasiveness (Sec. 4): No Known Nonnative Population**
- **Overall Climate Match Category (Sec. 7): Low**
- **Certainty of Assessment (Sec. 8): Low**
- **Remarks/Important additional information:** The tail spine is covered by a sheath containing venom glands; the venom is capable of injuring humans.
- **Overall Risk Assessment Category: Uncertain**

10 Literature Cited

Note: The following references were accessed for this ERSS. References cited within quoted text but not accessed are included below in Section 11.

- AquaScapeOnline. 2018. Aquatic live stock: Henlei Stingray. Available:
<https://www.aquascapeonline.com/aquatic-live-stock-fresh-water-fish-stingrays-black-stingrays-henlei-stingray/> (September 2018).
- Cardoso dos Santos J, Grund LZ, Seibert CS, Marques EE, Soares AB, Quesniaux VF, Ryffel B, Lopes-Ferreira M, Lima C. 2017. Stingray venom activates IL-33 producing cardiomyocytes, but not mast cell, to promote acute neutrophil-mediated injury. *Scientific Reports* 7:7912.
- Charvet-Almeida P, de Araújo MLG, Rosa RS, Rincón G. 2002. Neotropical freshwater stingrays: diversity and conservation status. *Shark News* 14:1–2.

- Eschmeyer WN, Fricke R, van der Laan R, editors. 2018. Catalog of fishes: genera, species, references. California Academy of Science. Available: <http://researcharchive.calacademy.org/research/ichthyology/catalog/fishcatmain.asp> (September 2018).
- FFWCC (Florida Fish and Wildlife Conservation Commission). 2018. Conditional species list. Tallahassee, Florida: Florida Fish and Wildlife Conservation Commission. Available: <http://myfwc.com/wildlifehabitats/nonnatives/regulations/conditional/> (September 2018).
- Froese R, Pauly D, editors. 2018. *Potamotrygon henlei* (Castelnau, 1855). FishBase. Available: <http://www.fishbase.org/summary/Potamotrygon-henlei.html> (September 2018).
- GBIF Secretariat. 2018. GBIF backbone taxonomy: *Potamotrygon henlei* (Castelnau, 1855). Copenhagen: Global Biodiversity Information Facility. Available: <https://www.gbif.org/species/2419331> (September 2018).
- [ITIS] Integrated Taxonomic Information System. 2018. *Potamotrygon henlei* (Castelnau, 1855). Reston, Virginia: Integrated Taxonomic Information System. Available: https://www.itis.gov/servlet/SingleRpt/SingleRpt?search_topic=TSN&search_value=943761#null (September 2018).
- Marques FPL. 2000. Evolution of Neotropical freshwater stingrays and their parasites: taking into account space and time. Doctoral dissertation. Toronto: University of Toronto.
- Marques FPL, Brooks DR. 2003. Taxonomic revision of *Rhinebothroides* (Eucestoda: Tetraphyllidae: Phyllobothriidae), parasites of Neotropical freshwater stingrays (Rajiformes: Myliobatoidei: Potamotrygonidae). *The Journal of Parasitology* 89:994–1017.
- Marques FPL, Brooks DR, Araújo MLG. 2003. Systematics and phylogeny of *Potamotrygonocetus* (Platyhelminthes, Tetraphyllidae, Onchobothriidae) with descriptions of three new species from freshwater potamotrygonids (Myliobatoidei, Potamotrygonidae). *Zoologica Scripta* 32:367–396.
- [OIE] World Organisation for Animal Health. 2020. OIE-listed diseases, infections and infestations in force in 2020. Available: <http://www.oie.int/animal-health-in-the-world/oie-listed-diseases-2020/> (October 2020).
- Poelen JH, Simons JD, Mungall CJ. 2014. Global Biotic Interactions: an open infrastructure to share and analyze species-interaction datasets. *Ecological Informatics* 24:148–159.
- Ramos HAC. 2017. Commercial species of freshwater stingrays in Brazil. Brasília, Brazil: Ministry of Environment, Brazilian Institute of Environment and Renewable Resources, Department of Sustainable Use of Biodiversity and Forests.

Reckziegel GC, Dourado FS, Neto DG, Junior VH. 2015. Injuries caused by aquatic animals in Brazil: an analysis of the data present in the information system for notifiable diseases. *Revista de Sociedade Brasileira de Medicina Tropical* 48:460–467.

Rincon G. 2004. *Potamotrygon henlei*. The IUCN Red List of Threatened Species 2004: e.T39402A10225965. Available: <http://www.iucnredlist.org/details/full/39402/0> (September 2018).

Sanders S, Castiglione C, Hoff M. 2018. Risk Assessment Mapping Program: RAMP. Version 3.1. U.S. Fish and Wildlife Service.

11 Literature Cited in Quoted Material

Note: The following references are cited within quoted text within this ERSS, but were not accessed for its preparation. They are included here to provide the reader with more information.

Baensch HA, Riehl R. 1995. *Aquarien atlas*. Band 4. Melle, Germany: Mergus Verlag GmbH, Verlag für Natur-und Heimtierkunde.

de Carvalho MR. 2016a. Description of two extraordinary new species of freshwater stingrays of the genus *Potamotrygon* endemic to the rio Tapajós basin, Brazil (Chondrichthyes: Potamotrygonidae), with notes on other Tapajós stingrays. *Zootaxa* 4167:1–63.

de Carvalho MR, Lovejoy N, Rosa RS. 2003. Potamotrygonidae (River stingrays). Pages 22–28 in Reis RE, Kullander SO, Ferraris CJ Jr, editors. *Checklist of the freshwater fishes of South and Central America*. Porto Alegre, Brazil: EDIPUCRS.

Eschmeyer WN, editor. 1998. *Catalog of fishes*. San Francisco: California Academy of Sciences, Special Publication.

Halstead BW. 1970. *Poisonous and venomous marine animals of the world*. Princeton, New Jersey: The Darwin Press.

Pantano-Neto J. 2001. Estudo preliminar da anatomia descritiva e funcional associada à alimentação em raias de água-doce (Potamotrygonidae, Myliobatiformes, Elasmobranchii). Master's thesis. Brazil: Universidade de São Paulo-USP.